**Padeswood Cement Works**

Hanson Cement

**07/06/2017**

Reference number GB01T16H31

# TRANSPORT TECHNICAL NOTE

# PADESWOOD CEMENT WORKS

TRANSPORT TECHNICAL NOTE

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# 1. INTRODUCTION

## 1.1 General

1.1.1 SYSTRA Ltd (SYSTRA) has been commissioned by Golder Associates on behalf of Hanson Cement to prepare a Transport Technical Note in support of a planning application to redevelop part of the existing Padeswood Cement Works site. The assessment was undertaken in accordance with the scope set out in the Screening and Scoping Report prepared by Golder Associates in March 2017 (re: 1773079.500/A.0) and issued to Flintshire County Council.

1.1.2 The development proposals are to demolish the existing rail loading facilities and adjacent cement storage silos at the site and in their place erect a new vertical roller mill (VRM), rail loading facilities, undertake modifications to the existing railway line and ancillary development.

1.1.3 The existing Padeswood Cement Works is located to the west of the villages of Penyffordd and Penymynydd near Mold, Flintshire. The general location of the site is indicated by Figure 1 below:

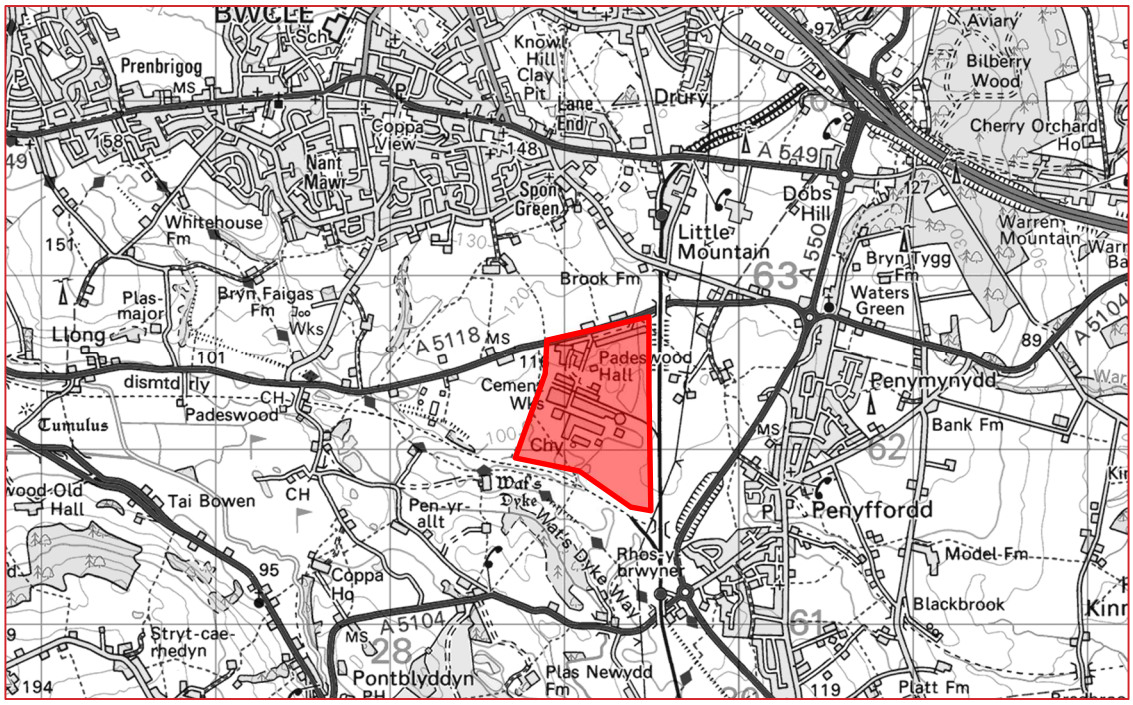


**Figure 1. Site Location**

1.1.4 The development proposals will facilitate a significant change in the transport arrangements associated with the site as there will be a large shift from road based transport of materials to rail based transport. The purpose of this Transport Technical Note is to identify the changes that will take place in the transport arrangements for the site including the benefits that the new development will bring in terms of reducing HGV movements on the road network. This Technical Note also considers the temporary transport impacts associated with the construction stage of the development.

1.1.5 The development will aim to minimise traffic impacts during the construction works associated with the proposed development and to minimise impacts on local residents and users of the area. In particular, the document seeks to clarify the traffic and associated impacts from the construction stages of the development. Potential management and mitigation measures are identified that could be used to address the potential impacts during the duration of the construction works.

1.1.6 This Technical Note seeks to define the mechanisms for managing the movement of construction related vehicular traffic associated with the development and also the processes for monitoring and consultation with parties who may be affected by construction traffic and construction activities.

## 1.2 Document Structure

1.2.1 Section 2 details the existing site characteristics (including transportation arrangements) and provides information on the existing transport network around the site.

1.2.2 Section 3 sets out information for the proposed development and the transport arrangements that will be in place once the development becomes operational. This includes details on the reduction in road-based transport to and from the site compared with the existing operation.

1.2.3 Section 4 identifies the activities to be undertaken during the construction stage and provides construction details for the project including the programme, predicted construction traffic movements and workforce trip generation characteristics. A range of potential measures to manage the construction process and to control and manage construction vehicle movements is identified.

1.2.4 The Transport Technical Note concludes with a summary and conclusions at Section 5.

# 2. EXISTING SITE AND EXISTING TRANSPORT NETWORK

## 2.1 Site Characteristics

2.1.1 The existing Padeswood Cement Works lies some 5.5km to the east of Mold and approximately 2km south-east of Buckley. The site is bound by the A5118 to the north, farmland to the south and west, and by the Liverpool to Wrexham railway line to the east.

2.1.2 The site opened in 1949 following a post-war requirement for cement. When the site opened there were initially two wet kilns supplemented by a dry kiln in the mid-1960s. Kiln 4 was commissioned in 2006 and the three older kilns were decommissioned. Recent times have seen the installation of a plastic packing machine for cement, an upgrade in capability to use recycled paper and plastics as a fuel and the erection of a new building and creation of an external storage area in relation to the storage, loading and transportation of packed cement products.

## 2.2 Site Access

2.2.1 The site has a single point of access in the form of a priority junction onto the A5118. The junction has a wide bellmouth and there is a deceleration taper provided from the westbound carriageway into the access. There is no right-turning refuge provided for vehicles turning in from the eastbound carriageway while there is a minor access opposite leading into a car sales area and garage. The A5118 is subject to a 40mph speed limit across the junction.

## 2.3 Pedestrian Facilities

2.3.1 Given the rural location of the development there is limited footway provision along the A5118. There are short sections of footway on both sides of the access junction (on the south side of road) which provide an opportunity to cross the road and access a footpath on the north side of the A5118 which provides a link east to a bus stop and residential development. There is no footway link to the west, although it is understood that the westbound bus service picks up from the short section of footway to the east of the site access junction.

2.3.2 Padeswood Drive runs parallel to the south side of the A5118 just to the east of the site access for a length of approximately 235m. The route is a private road and is a shared surface with no defined pedestrian facilities.

## 2.4 Cycling Facilities

2.4.1 The nearest National Cycle Routes to the development are located approximately 7.0km to the north east and follow the River Dee. There are no specific cycle facilities at the site access or on the adjacent A5118.

## 2.5 Public Transport Accessibility

**Bus**

2.5.1 The site can be accessed by the X1 bus service which operates on the A5118. This service is operated by Stagecoach and runs a limited daily service Monday to Saturdays. The service provides a connection to Ruthin, Mold, and Chester.

**Rail**

2.5.2 The site is served by a private railway which connects to the Liverpool to Wrexham railway line. Presently this railway is used by coal trains delivering to the site.

2.5.3 Buckley Rail Station is located off Little Mountain Road to the north of the site and is 2.4km on foot from the site access via an indirect route. The station provides access to train services between Bidston and Wrexham Central every 60 minutes Monday to Saturday, with a reduced frequency at night and on Sundays.

## 2.6 Existing Road Network

2.6.1 The main point of vehicular access to the site is provided from the A5118 via a priority junction as indicated by Figure 2.


**Figure 2. Site Access Junction**

2.6.2 The A5118 is a good standard single carriageway distributor road between 6.5m and 7.0m wide. The road is subject to a 40mph speed limit adjacent to the site access but increases to a 60mph derestricted limit approximately 100m to the west of the site access junction. Street lighting is provided within the 40mph section of the route. The A5118 provides access to Penymynydd, Padeswood, Mold, and Llong. There are a number of access points to farms, commercial properties and residential properties along the length of the route.

2.6.3 The A5118 links to the A550 to the east which runs north-south providing a connection with the main A55 east-west route and to the motorway network to the north-east. To the west, the A5118 links to the A541 which provides a further north-south link.

2.6.4 Traffic flow information[1] indicates that the A5118 currently carries approximately 5,284 vehicles per day (Average Annual Daily Flow). Of this total, there are on average 357 HGV movements which equates to 6.8% of the total flow.

## 2.7 Summary

2.7.1 In summary, the site sits within a rural location and has access to the local bus network and has good access to the strategic road network. The site is also served by an existing rail connection which is currently used for coal deliveries.

2.7.2 Given the rural location of the development there are limited pedestrian and cycling facilities in the immediate area.

2.7.3 It is considered that the existing transport network serves the site well in terms of it being accessible by a range of transport modes.

[1] Traffic flow data from DfT Traffic Count Database

# 3. PROPOSED DEVELOPMENT AND TRANSPORT CHARACTERISTICS

## 3.1 Proposed Development

3.1.1 The proposed development relates to the demolition of the existing rail loading facilities and adjacent cement storage silos; the erection of a new vertical roller mill (VRM) and rail loading facility; modifications to, and extension of, an existing railway line; together with ancillary development (including three steel cement storage silos, belt conveyors and pneumatic pipelines.

3.1.2 The area of the site is some 3.1 hectares. The plan of the site and the application area where the proposed VRM will be situated is illustrated by Figure 3 below.

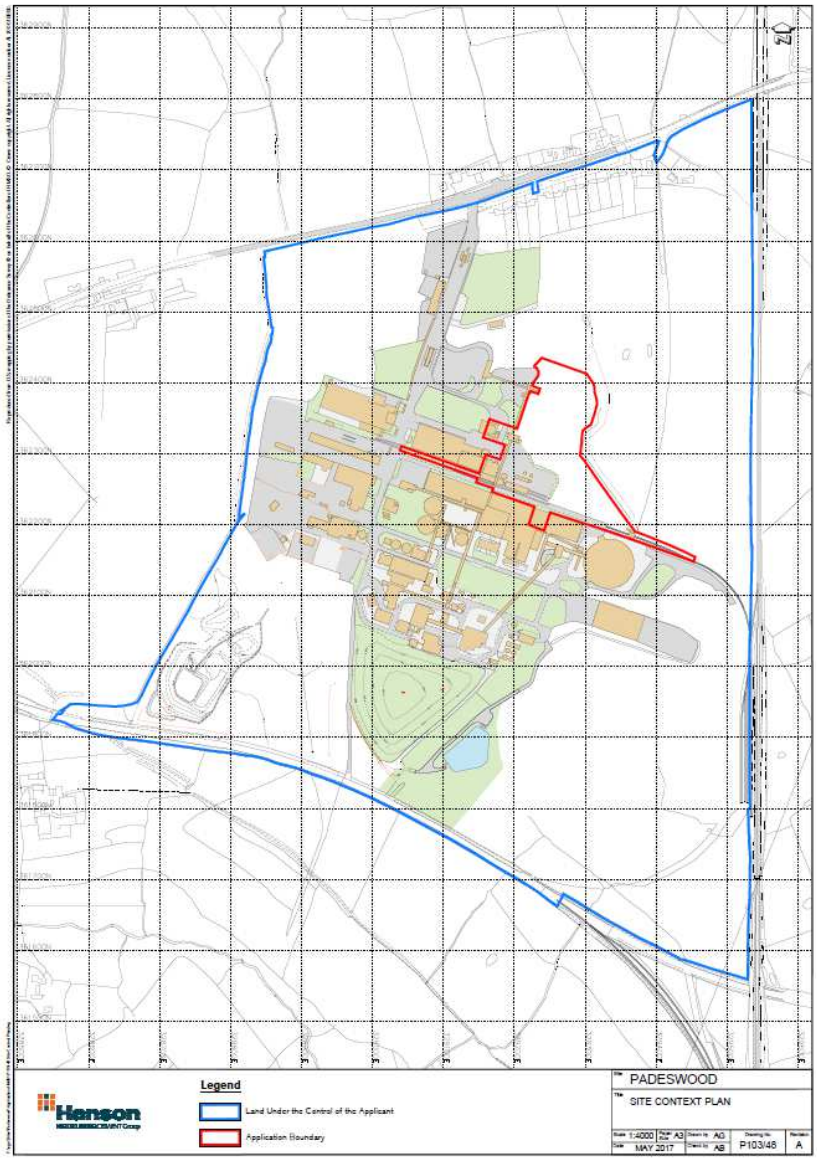


**Figure 3. Indicative Site Layout**

## 3.2 Existing Development Traffic

3.2.1 Records of existing inbound and outbound traffic flows at the site access junction on the A5118 indicate that there are typically 244 HGV vehicles travelling in and out of the site per day. The breakdown of these traffic movements is indicated by Table 1 below.

**Table 1. Existing HGV Vehicle Movements**

| MATERIAL BEING MOVED | ANNUAL MOVEMENTS | DAILY MOVEMENTS |
|---|---|---|
| **Raw Materials** | | |
| Limestone | 31,291 | 109.4 |
| Sand | 1,595 | 6.1 |
| PFA[2] | 7,033 | 27.0 |
| Coal | 1,842 | 7.1 |
| Cemfuel | 466 | 1.8 |
| SRF[3] | 1,020 | 3.9 |
| Gypsum | 1,121 | 4.3 |
| **Products** | | |
| Cement | 17,624 | 68 |
| Clinker | 4,182 | 16 |
| Bypass Dust | 91 | - |
| Total | 66,265 | 244 |

3.2.2 In addition to the above, there are typically 66 staff vehicles, 32 HGV driver vehicles and 40 contractors vehicles that access the site each day. These vehicles are cars or lights goods vehicles (vans). There are a total of 96 staff employed at the site at the moment.

[2] Pulverised Fuel Ash
[3] Solid Recovered Fuel

3.2.3 The current operational hours of the site are 24/7 for manufacturing. There are a variety of shift patterns worked to cover the operational requirements of the site, with 35 employees working a rotating continental shift pattern; 9 employees working a rotating 3 shift pattern; and the remaining employees working day shift. In addition, there are 36 HGV drivers based at Padeswood with approximately 28 working from the site on any given week day with start and finish times staggered over the 24 hour period. Deliveries from the plant operate 6am Monday to 12 noon Saturday with none on Sunday. Dispatches of limestone clinker are Monday to Friday and Saturday morning.

3.2.4 Given the shift times in operation at the site, there is no significant direct traffic impact on the typical morning and evening peak periods.

## 3.3 Do Minimum Scenario

3.3.1 If no major changes are undertaken at the site, production is expected to increase over the next 2 years to 2018. The resultant increase in vehicle movements is indicated by Table 2 below.

**Table 2. Future HGV Vehicle Movements**

| MATERIAL BEING MOVED | ANNUAL MOVEMENTS | DAILY MOVEMENTS |
|---|---|---|
| **Raw Materials** | | |
| Limestone | 41,045 | 143.5 |
| Sand | 2,092 | 8.0 |
| PFA | 9,225 | 35.5 |
| Coal | 2,416 | 9.3 |
| Cemfuel | 611 | 2.4 |
| SRF | 1,338 | 5.1 |
| Gypsum | 1,134 | 4.4 |
| Limestone Cement | 1,182 | 4.1 |
| **Products** | | |
| Cement | 21,281 | 82 |
| Clinker | 7,491 | 29 |
| Bypass Dust | 120 | - |
| Total | 87,935 | 323.3 |

3.3.2 It has been assumed that the staff numbers will not significantly change over this period so the corresponding vehicle movements associated with staff would not alter for the Do Minimum scenario.

## 3.4 Traffic Associated with New Development

3.4.1 The proposals for the site comprise the installation of a new VRM (Mill 5) and extension of an existing railway line. In conjunction with the new equipment and facilities, the proposals will include the mothballing of Mills 1, 2 and 4. Mill 3 will remain operational.

3.4.2 The private railway line is currently used for importing coal to the site and it is proposed that this will continue. The existing cement rail loading facilities are obsolete. Therefore, in addition to the installation of the new VRM, the existing rail loading facilities will be demolished and replaced with new facilities and silos. The new rail loading facility (which incorporates a re-alignment of the existing track) will allow 4,000 to 5,000 tonnes of cement to be transported by rail from the site each week.

3.4.3 The provision of the rail loading facility will enable the site to export a proportion of its cement production by rail, to other Hanson Cement manufacturing facilities and cement terminals. Therefore, there will be a reduction in the number of long distance HGV movements from the site by road. The revised road-based HGV movements are indicated by Table 3 while Table 4 details the reduction in HGV flows as a result of switching a proportion of road based transport to rail.

Table 3. Predicted Future Road Based Traffic Movements and Reduction in HGV flows

| MATERIAL BEING MOVED | ANNUAL MOVEMENTS | DAILY MOVEMENTS |
|---|---|---|
| **Raw Materials** | | |
| Limestone | 42,329 | 148 |
| Sand | 2,092 | 8.0 |
| PFA | 9,225 | 35.5 |
| Coal | 2,416 | 9.3 |
| Cemfuel | 611 | 2.4 |
| SRF | 1,338 | 5.1 |
| Gypsum | 1,568 | 6.0 |
| **Products** | | |
| Cement | 20,249 | 78 |
| Clinker | - | - |
| Bypass Dust | 120 | - |
| Total | 79,730 | 292.3 |

Table 4. Reduction in Two-way HGV Movements once Development is Operational[4]

| MEASURE | |
|---|---|
| Reduction in Daily HGV movements | 31 |
| Reduction in Annual Road Movements | 8,089 |
| Additional Annual Rail Movements | 175 |

3.4.4 As no new jobs will be directly created by the proposed development, there will be no change in traffic movements from the existing site staff. Table 4 demonstrates that there will be a significant reduction in daily and annual HGV vehicle movements (approx. 10%) as a result of the proposed development.

[4] Differences expressed between the "Do Minimum" (without Mill 5 and rail loading facility) and the "Do Something" (with Mill 5 and rail loading facility) scenarios.

# 4. CHARACTERISTICS OF CONSTRUCTION WORKS

## 4.1 Construction Programme

4.1.1 The construction programme includes elements of demolition and site clearance, and the construction of the extension to the railway and installation of the VRM. The following is a list of the main construction items associated with the project:

- Demolition of redundant plant & buildings;
- Ground preparation and Civils Works;
- Construction of new Rail Loading Facility;
- Modification and Extension of Existing Railway Line including associated civil works & weighbridge; and
- Construction of new Cement Milling and Storage Operations.

## 4.2 Overall Construction Programme

4.2.1 It is envisaged that the works will be undertaken over a 50 week period.

4.2.2 Subject to securing the necessary consents, it is the developer's intention to commence construction in late 2017 / early 2018.

## 4.3 Potential Construction Impacts

**Predicted Traffic Impacts**

4.3.1 Estimates of traffic generation associated with the construction phase of the development have been identified from first principles and have taken on board the following activities:

- Site clearance and ground preparation;
- Delivery and removal of plant / materials in relation to site mobilisation and set up of site compound;
- Miscellaneous deliveries; and
- Construction worker travel movements.

4.3.2 It is not possible to provide a wholly accurate estimate of traffic movements for the construction stage until the contractor team is appointed and they have the opportunity to fully plan the construction works. Notwithstanding this, robust assumptions have been made at this stage to identify the likely worst case and average traffic movements to and from the construction site.

4.3.3 Information received identifies four key stages in the construction process: demolition and site clearance; civils works; machinery and structure; and erection of the VRM and associated ancillary facilities.

4.3.4 The area where the new VRM will be situated will require site clearance and ground preparation, including reducing the ground level to match the surrounding plant and buildings. There is an estimated 13,500 tonnes of material which will require to be sorted and stockpiled within the Cement Works.

4.3.5 The material will be where possible reused and fed back into the cement manufacturing process. Any material that cannot be recycled will be removed from site and disposed of at a licensed waste management facility, as appropriate. However, for the purposes of this assessment it has been assumed that all of the material generated would leave the site.

4.3.6 Based on the identified 13,500 tonnes of material and utilising a 20 tonne tipper there would be some 675 loads leaving the site. This equates to a total of 1,350 two-way vehicle movements, assuming that each tipper arrived empty and left the site fully laden. It is anticipated that the site clearance and levelling will occur over an eight week period, which is an average of 168 to 170 two-way movements per week.

4.3.7 Table 5 illustrates the traffic movements anticipated for the projected 50 weeks of the construction programme. This indicates the number of construction traffic movements entering and leaving the site. This gives a total of approximately 874 construction traffic movements into the site and 874 movements out of the site for the 50 week period.

**Table 5. Construction Traffic Movements**

| DESCRIPTION | MATERIAL TONNES | LOAD SIZE (TONNES) | HGV MOVEMENTS (TWO-WAY) |
|---|---|---|---|
| Site Clearance and Levelling | 13,500 | 20 | 1,350 |
| Demolition | - | - | 20 |
| Civils | 1,000 | 14.4 | 138 |
| Machinery and Structure | 1,000 | 10 | 200 |
| Erection | - | - | 40 |
| Total | | | 1,748 |

4.3.8 The above table indicates that there will be approximately 1,748 two-way HGV movements over the construction period which is expected to extend over 50 weeks. This equates to an average of 35 HGV trips per week, however the site clearance and levelling will occur over an eight week period during the early period of the project and assumes that all the material would have to leave site for disposal.

4.3.9 Based on the eight week period for the site clearance and levelling, there would be an average of 169 additional two-way trips per week, or circa 28 movements per day. The remaining 398 two-way HGV movements would occur over the remaining 42 weeks. This equates to just 9 HGV trips per week or less than 2 per day on average.

4.3.10 It should be noted that this assessment assumes that none of the material on site can be re-used and would all be removed. The assessment also considers that the site clearance and levelling occur before the other activities. In practice the site clearance and levelling could occur simultaneously with other activities and the level of HGV trips predicted in Table 5 represents a robust estimation of the maximum number of movements for the construction period.

4.3.11 It is anticipated that no more than a maximum of 85 construction workers would be employed at the site during the construction period. These staff would likely travel to the site in cars, light vans or by contractor mini-bus although our review of the existing transport network has indicated that it would be possible to access the site by bus.

## 4.4 Impact of Construction Traffic Movements

4.4.1 The impact of the construction traffic is not considered to be significant in terms of having any impact on the capacity of the external road network.

## 4.5 Measures to Reduce and Mitigate Construction Impacts

**Design Principles**

4.5.1 The development has been designed in such a way as to minimise the amount of earthworks required, minimise the amount of material that requires to be taken off- and on-site and minimising the amount of demolition arisings that require to be removed from site. Traffic management, including the appropriate storage of materials, access and egress, will also be considered as part of the construction phase Health & Safety Plan in accordance with The Construction (Design and Management) (CDM) Regulations 2015.

**Construction Access to Site**

4.5.2 Construction traffic will use the existing access point onto the A5118. The existing road and rail access points are indicated by Figure 4.

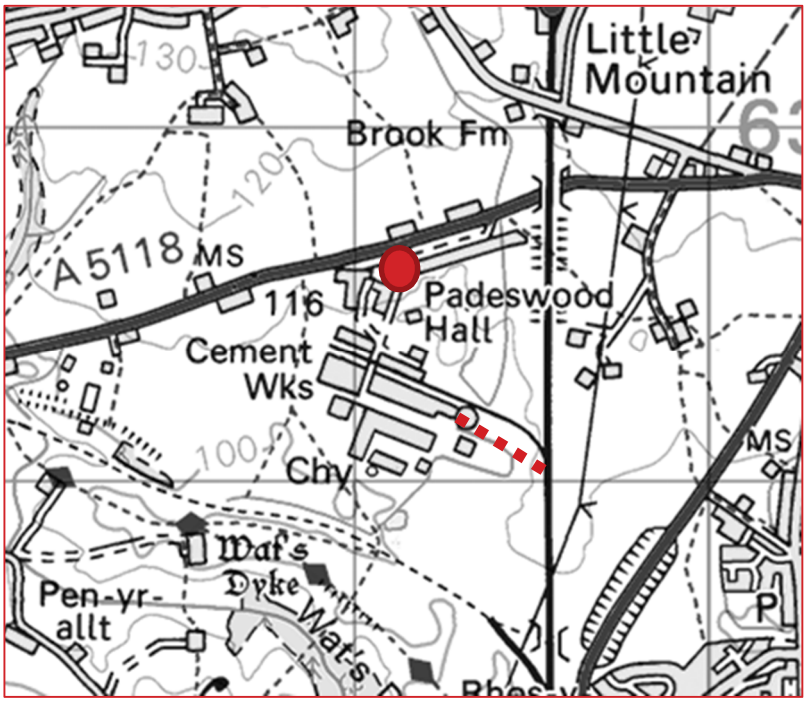


**Figure 4. Location of Site Access**

4.5.3 As the access road is gated this will ensure that there is no unauthorised access to the construction area by members of the public.

**Delivery Control**

4.5.4 Hanson and the main contractor will plan and manage deliveries and collections from the site to minimise the impact on the surrounding road network and to minimise the impact on the existing operation of the site

4.5.5 In order to manage the delivery of materials and plant, Hanson will implement the following measures where possible during the construction period:

- The number of delivery trips shall be minimised through a combination of consolidated ordering, rationalising suppliers and consolidated deliveries;
- On-site waste shall be minimised through recycling and re-use to minimise the number of collections from site; and
- Under no circumstance shall lorries be allowed to lay-up in surrounding roads.

4.5.6 The contractor will plan and manage deliveries and collections from the site to minimise the impact on the surrounding road network. Deliveries will be planned well in advance and on-site activities will be co-ordinated so that concentrated peaks in traffic movements on and off the site are avoided.

**Banksmen**

4.5.7 Where appropriate, banksmen will be deployed to assist in the management of HGV construction traffic within the site. These banksmen would likely be deployed during peak construction periods.

4.5.8 A banksman will be deployed at the site access point to control access and egress in line with required security procedures for the site.

**Contractor Speed Limit**

4.5.9 The contractors will be briefed on the site speed limit through induction sessions and through regular staff briefings. Other parties responsible for site deliveries will also be instructed on the restrictions and made aware of the requirements relating to existing road users.

**Designated Construction Routes to Site**

4.5.10 Hanson will agree construction routes with suppliers so that only these routes are used in order to avoid any impacts on other residential areas. This will be in accordance with current arrangements for the site.

**Measures to Reduce Dust and Debris**

**Mechanical Road Sweeping**

4.5.11 Unless unavoidable, no vehicles used for travel on public roads will be permitted to drive over broken unsealed ground in order to minimise the potential for tracking mud, dust and stones outside of the site. The works wheel wash will be available for construction traffic to use, if necessary.

4.5.12 Notwithstanding the above, a road brush will be used as required to maintain clean traffic routes within the site and external to the site as necessary.

**Covering of Loads**

4.5.13 Where possible, HGVs carrying material to and from site will be covered during transportation to minimise wind-blown material from being deposited onto the public road network.

**Dust Suppression**

4.5.14 During periods of particularly dry weather, dust suppression measures such as water spraying will be used on the internal and external access roads where necessary.

**Construction Site Operating Hours**

4.5.15 Construction activities are proposed to be undertaken during the following hours as stipulated in the previous planning conditions:

- 08:00 – 19:00 Monday to Friday; and
- 08:00 – 13:00 Saturday.

4.5.16 There will be no construction activities on a Sunday or on bank holidays.

**Workforce Travel and Parking Arrangements**

4.5.17 It is unlikely that a high proportion of the on-site workforce will walk to the site. It is more likely that the majority of the workforce will travel to the site either by private car or via a contractor's works mini-bus or van. Given that the workforce is expected to peak at 85 people, the traffic impacts associated with commuting to and from the site are not expected to be significant. Notwithstanding this, staff will be encouraged to either car share or travel by works bus to minimise traffic movements and minimise on-site parking requirements.

4.5.18 Car parking for the workforce will be provided entirely within the confines of the site boundary and no overspill will be permitted onto the public road network within the immediate area especially on Padeswood Drive.

**Vehicle Types**

4.5.19 There will be a mix of construction vehicles accessing the site which can be summarised as follows:

- Flat bed lorries delivering materials;
- Tipper trucks delivering material and taking material away;
- Concrete trucks;
- Vans;
- Construction worker cars;
- Low loaders delivering plant, etc.; and
- A small number of abnormal loads delivering VRM components.

4.5.20 Hanson will always ensure that an appropriate vehicle is used for the intended task. In the case of abnormal loads, all notification procedures will be followed and advanced notice provided to ensure that any disruption is kept to a minimum.

**Vehicle Movement Monitoring**

4.5.21 The number of vehicles travelling on and off the site will be monitored during the construction works. This will be achieved through the control point at the secure access points. The access points will be staffed and all vehicle movements will be recorded in and out so that there is a daily record of movements on and off the site.

**Traffic Management within Site**

4.5.22 The reversing of vehicles on the site will be minimised through safe working practices and planning of the works. A banksman will be used where deliveries are required to reverse into position and all HGVs will be fitted with reversing alarms. No reversing into the site from the external road network will be permitted.

# 5. SUMMARY AND CONCLUSIONS

## 5.1 Summary

5.1.1 Systra has been commissioned by Golder Associates on behalf of Hanson Cement to prepare a Transport Technical Note for the construction of a new VRM at Padeswood Cement Works which also incorporates a replacement rail loading facility.

5.1.2 Information has been detailed in relation to the baseline accessibility of the site and it can be concluded that while the site sits in a rural location, it is still accessible by a range of transport modes. It is considered that the existing network is suitable to serve the site following the redevelopment proposals without any changes to the external network.

5.1.3 The existing traffic movements have been identified travelling on and off the site. These flows have been compared with the future operation of the site in a situation where there is no redevelopment work (Do Minimum Scenario) and compared with the scenario whereby the VRM and rail loading facility are constructed. The analysis shows that the construction of the VRM and rail loading facility will bring about a significant reduction in road-based HGV movements. This relates to the elimination of the transportation of clinker off site (which would be processed in the new VRM) and the significant export of produced cement by the improved rail connection. This equates to a reduction of 8,089 two way annual HGV trips. This represents a reduction of 31 HGV movements per day or approximately 10%. This reduction will benefit the local road network in the vicinity of the site and will give rise to environmental benefits through a large reduction in HGV miles travelled.

5.1.4 The volume of construction traffic has been calculated and there will be a maximum of 1,748 two-way HGV movements over the 50 week construction period. This equates (on average) to 35 HGV trips per week or 6 per day. It should be noted that there is an initial 8 weeks for site clearance and ground levelling which equates to a maximum of 1,350 two way trips. This is an average 169 trips per week, or circa 28 movements per day.

5.1.5 This level of trip generation is not considered significant in capacity terms and will not significantly impact the surrounding road network. It is however recognised that the HGV movements to and from site for the construction workers could be by different drivers not normally serving the site so it is important to consider what measures are required to maintain safety and minimise disruption to others.

5.1.6 Management measures have been identified for the construction stage of the development to ensure on-site safety is maintained and to ensure that there are no issues created externally to the site. It is considered that when these measures are implemented, there will be no significant impacts on local residents or existing road users.

## 5.2 Conclusion

5.2.1 The proposed development will bring about significant benefits in terms of increasing the transportation of goods by rail and at the same time reducing road based HGV movements. This will bring about a reduction in HGV movements on the adjacent A5118 and an overall reduction in HGV miles travelled.

5.2.2 The impact of traffic associated with the construction of the development is low compared to the traffic arising from the normal operation of the plant and can be appropriately mitigated with measures put in place to minimise the impact on local residents.

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